

2013 Rabies Summary

Massachusetts Department of Public Health

The following summarizes data collected on animal specimens from Massachusetts sent to the William A. Hinton State Laboratory Institute (HSLI) for rabies testing from January to December 2013. Cumulative reports summarizing rabies testing from 1992-2002, and annual reports from 2003 to 2012 are available on the MDPH website and can be found at www.mass.gov/dph/rabies.

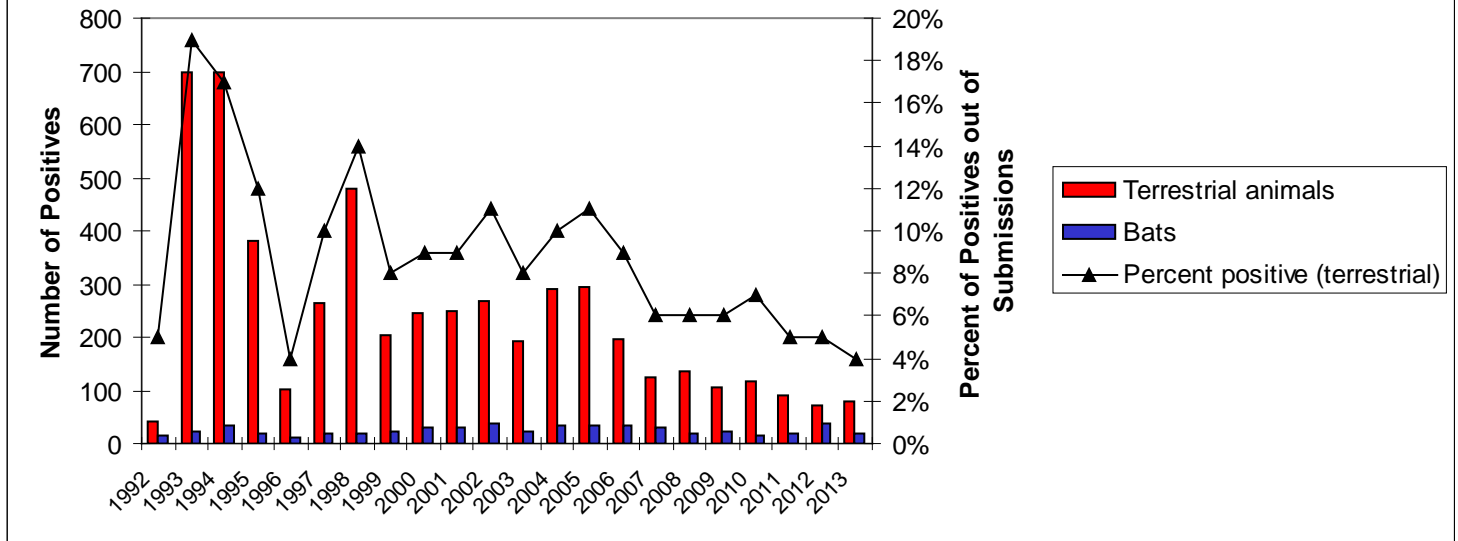
Number of Submissions and Positive Results by Year

The number of terrestrial animals that tested positive in 2013 was similar to that of the previous two years (see **Table 1 and Figure 1**). The number of bats submitted for rabies testing decreased by 13% between 2012 and 2013, and the percent positive, 1.7%, was the lowest ever recorded. In almost every month, fewer bats were submitted for testing as compared to the same months in 2012 (see **Table 3**). The elevated ambient temperatures that occurred in 2012 may have resulted in abnormal behavior patterns in local bat populations that were not observed in 2013.

TABLE 1. Number of Submissions, Positive Results and Percent Positive by Year and Type of Animal						
	TERRESTRIAL ANIMALS			BATS		
Year	Number Submitted	Number Positive	% Positive*	Number Submitted	Number Positive	% Positive*
1992	926	42	5%	143	15	10%
1993	3660	698	19%	289	22	8%
1994	4119	700	17%	391	34	9%
1995	3175	383	12%	241	17	7%
1996	2701	103	4%	277	12	4%
1997	2771	264	10%	334	17	5%
1998	3483	480	14%	439	18	4%
1999	2643	205	8%	595	21	4%
2000	2666	247	9%	611	29	5%
2001	2615	248	9%	710	32	4%
2002	2505	267	11%	613	36	6%
2003	2358	193	8%	602	23	4%
2004	2842	291	10%	600	34	6%
2005	2653	296	11%	708	33	5%
2006	2122	197	9%	756	34	5%
2007	1988	123	6%	787	29	4%
2008	2298	135	6%	748	19	3%
2009	1747	106	6%	696	21	3%
2010	1740	117	7%	678	14	2%
2011	1700	90	5%	753	20	3%
2012	1594	73	5%	1196	38	3%
2013	1644	79	5%	1045	18	2%
Total	53,950	5,337	10%	13,212	536	4%

* Calculated to nearest percent

Figure 1: Numbers of Animals Positive for Rabies and Percent Positive by Year: Massachusetts, 1992-2013



Notable Rabies Situations

In 2013, 2,689 specimens were submitted to the Hinton State Laboratory Institute (HSLI) for rabies testing. Of these specimens, 97 (4%) tested positive for rabies. **Table 2** shows data on positive animals in 2013.

As in 2012, only two domestic animals tested positive for rabies in 2013. A Suffolk County resident with a history of feeding feral cats took one into her home and then to a veterinary clinic for care. For the next two days, the resident and another adult cared for the cat, including administering oral medication. Two days later, the cat was brought back to the clinic with neurologic symptoms. The cat was euthanized and tested positive for rabies. Both the resident and the veterinarian had been scratched by the cat and received PEP. 10 others at the clinic and two in the household were evaluated, but PEP was not recommended. The local board of health sent out a reverse 911 call to alert residents and the local animal inspector collected additional stray cats that had likely been exposed to rabies.

A Worcester County family adopted two kittens from a local animal shelter. Ten days after bringing them home, one of them began behaving aggressively. Two days later it was brought to a veterinary hospital, euthanized and tested positive for rabies. PEP was recommended for all household members, two adults and two teenagers, all of whom sustained bites or scratches. Rabies boosters were recommended for several staff at the veterinary hospital who had high risk exposures. The second kitten was euthanized, but not tested.

During a one-week period in the fourth quarter, two skunks and a pig located on nearly adjacent properties in Berkshire County tested positive. A resident observed her two dogs chasing a skunk in her yard. The local animal control officer responded and shot the skunk. It was submitted and tested positive. Both dogs received booster doses of rabies vaccine. Five days later on a farm across the street, a resident observed abnormal behavior in one of his pigs. It later jammed itself underneath a barn at which time it was euthanized. At the same time, a sick skunk was seen walking out of the barn. Both animals tested positive for rabies. There were no additional human exposures. 30 additional pigs on the property were placed under quarantine by the local Animal Inspector. Eleven pigs on the property were slated to go to slaughter but were restricted due to the quarantine. The farm owner was advised not to slaughter the animals for personal consumption.

Number of Submissions and Positive Results by Species

Raccoons, skunks and foxes together, accounted for the large majority of rabies positive animals in Massachusetts (33%, 34% and 17% respectively), although the proportion of all rabies positive animals that they represent varied by quarter. (See **Figure 2**) Of note is that a slightly higher percentage of skunks tested positive than raccoons in 2013. This has not been observed in Massachusetts since 2008 and prior to that, only in 2003 and 2004. Although this is probably due to changes in the overall population levels in raccoons and skunks (i.e. skunk populations are higher and raccoon populations are lower during these years), if this occurred over multiple years, it could indicate emergence of a skunk-specific variant of rabies.

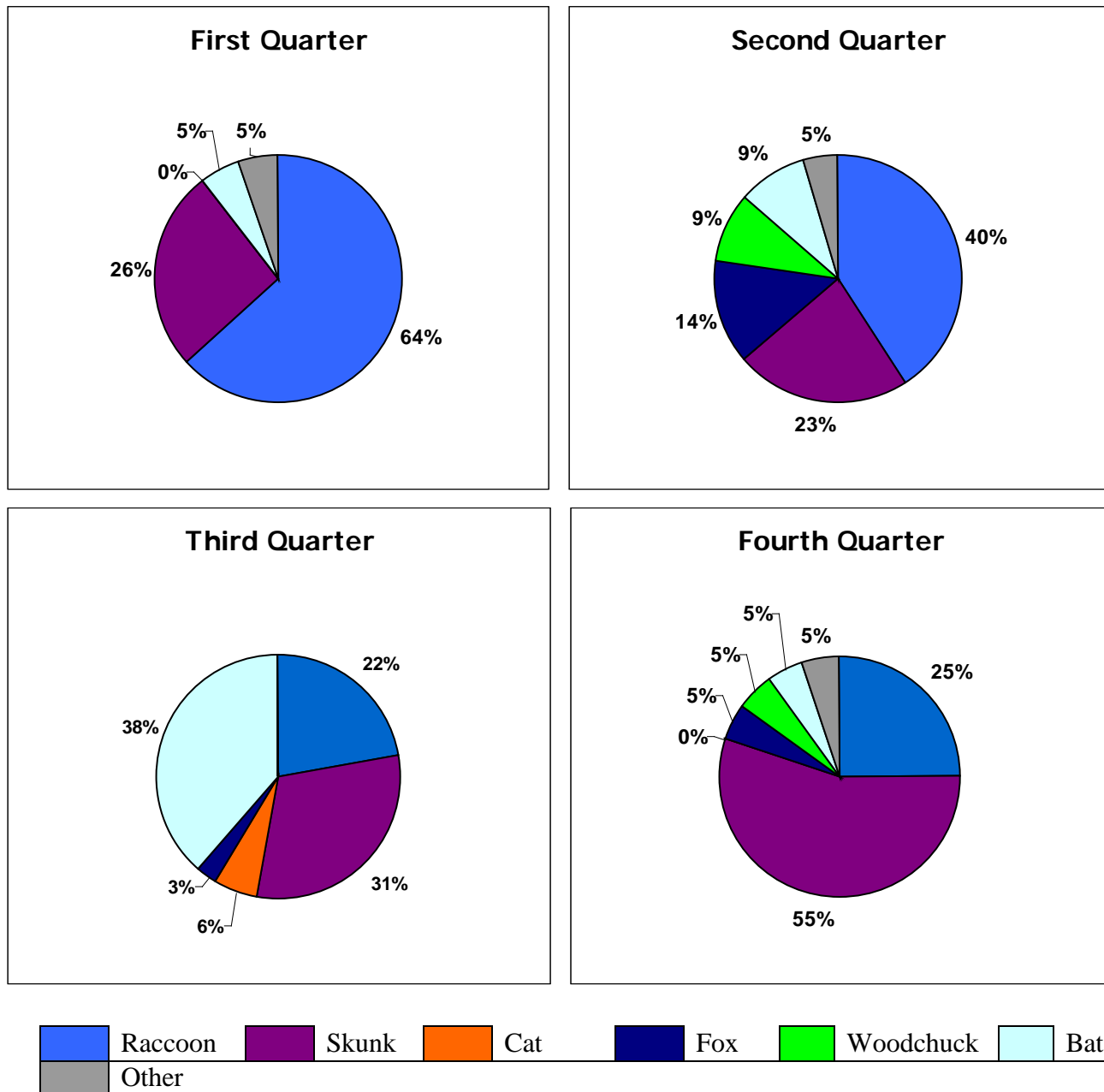
Table 2. Number of Animals Positive for Rabies/Animals Submitted (%*), 2013

	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			Total		
Animal	Number Positive	Number Submitted	%	Number Positive	Number Submitted	%	Number Positive	Number Submitted	%	Number Positive	Number Submitted	%	Number Positive	Number Submitted	%
Raccoon	12	24	50%	9	38	24%	8	27	30%	5	14	36%	34	103	33%
Skunk	5	9	56%	5	18	28%	11	50	22%	11	16	69%	32	93	34%
Cat	0	151	0%	0	185	0%	2	259	1%	0	186	0%	2	781	0%
Fox	0	3	0%	3	13	23%	1	7	14%	1	6	17%	5	29	17%
Woodchuck	0	1	0%	2	28	7%	0	25	0%	1	3	33%	3	57	5%
Bat	1	95	1%	2	183	1%	14	698	2%	1	69	1%	18	1045	2%
Cow	0	1	0%	0	1	0%	0	0	0%	0	3	0%	0	5	0%
Coyote	0	1	0%	0	0	0%	0	2	0%	0	1	0%	0	4	0%
Dog	0	105	0%	0	128	0%	0	133	0%	0	107	0%	0	473	0%
Other [†]	1	16	6%	1	35	3%	0	31	0%	1	17	6%	3	99	3%
Total	19	406	5%	22	629	3%	36	1232	3%	20	422	5%	97	2689	4%

* Calculated to nearest percent

† Bobcat (2), Pig

Figure 2. Proportion of All Positive Results Represented by Each Species, by Quarter, 2013



Cumulative Submissions and Positive Results by Month

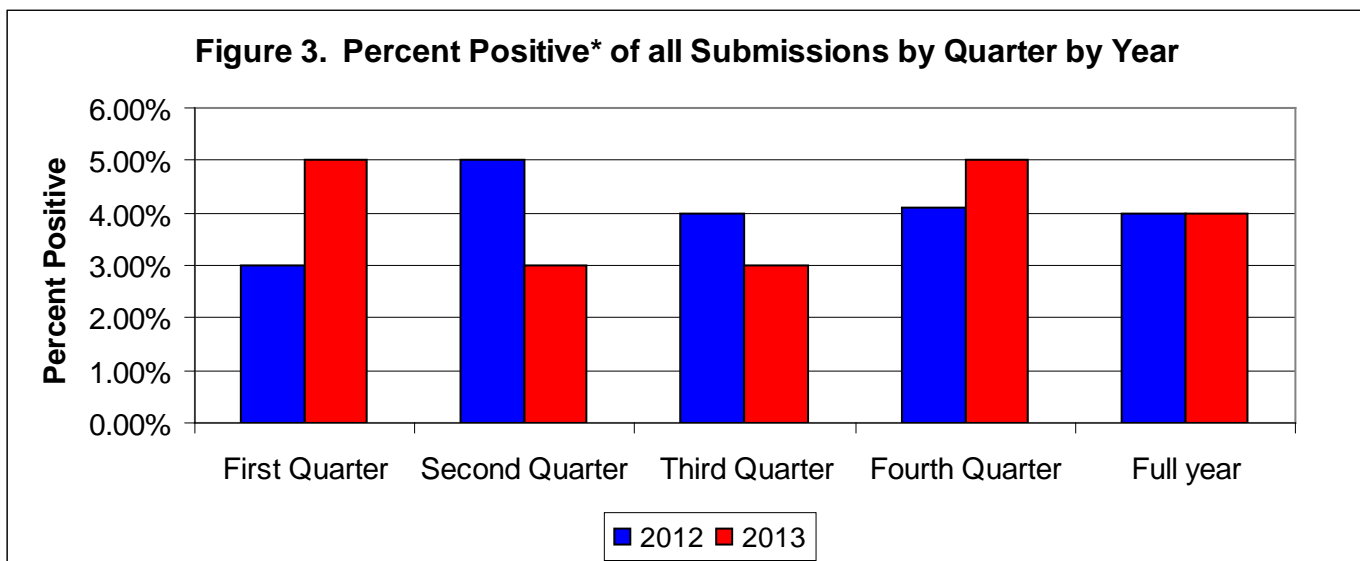
Animal submission numbers fluctuated throughout the year. As expected, the highest number of submissions occurred during June, July and August (see **Table 3**). The lowest number of submissions occurred during the winter months of December, January, and February. This same trend is seen annually and is due to the greater activity of wildlife species during the spring and summer months, coinciding with the time that humans increase their outdoor activity level. These simultaneous events result in more frequent contact between humans and wildlife, and lead to more animal rabies testing.

Table 3. Submissions, Number Positive for Rabies, and Percent Positive by Month and Animal Type, 2012 and 2013

Month	TERRESTRIAL ANIMALS						BATS					
	Submitted 2012	Positive 2012*		Submitted 2013	Positive 2013*		Submitted 2012	Positive 2012*		Submitted 2013	Positive 2013*	
January	108	5	5%	97	4	4%	43	1	2%	32	1	3%
February	113	5	4%	111	7	6%	38	0	0%	21	0	0%
March	118	4	3%	103	7	7%	42	0	0%	42	0	0%
April	121	7	6%	128	6	5%	17	3	18%	39	0	0%
May	134	9	7%	146	6	4%	103	6	6%	33	0	0%
June	167	7	4%	172	8	5%	103	2	2%	111	2	2%
July	199	11	6%	173	4	2%	233	5	2%	149	3	2%
August	179	8	4%	201	12	6%	510	12	2%	508	8	2%
September	133	6	5%	160	6	4%	37	5	14%	41	3	7%
October	130	7	5%	129	7	5%	19	2	11%	13	1	8%
November	101	1	1%	123	9	7%	28	1	4%	24	0	0%
December	91	3	3%	101	3	3%	23	1	4%	32	0	0%
TOTAL	1594	73	5%	1644	79	5%	1196	38	3%	1045	18	3%

* Calculated to nearest percent

The proportion of animals testing positive for rabies also varies throughout the year, generally showing a consistent pattern from year-to-year (see **Table 3**). The change in the percent positive is normally small between years during the same month and significant departures from this seasonal pattern can be used to detect alterations in the intensity of virus circulation in an area.



* Calculated to nearest percent

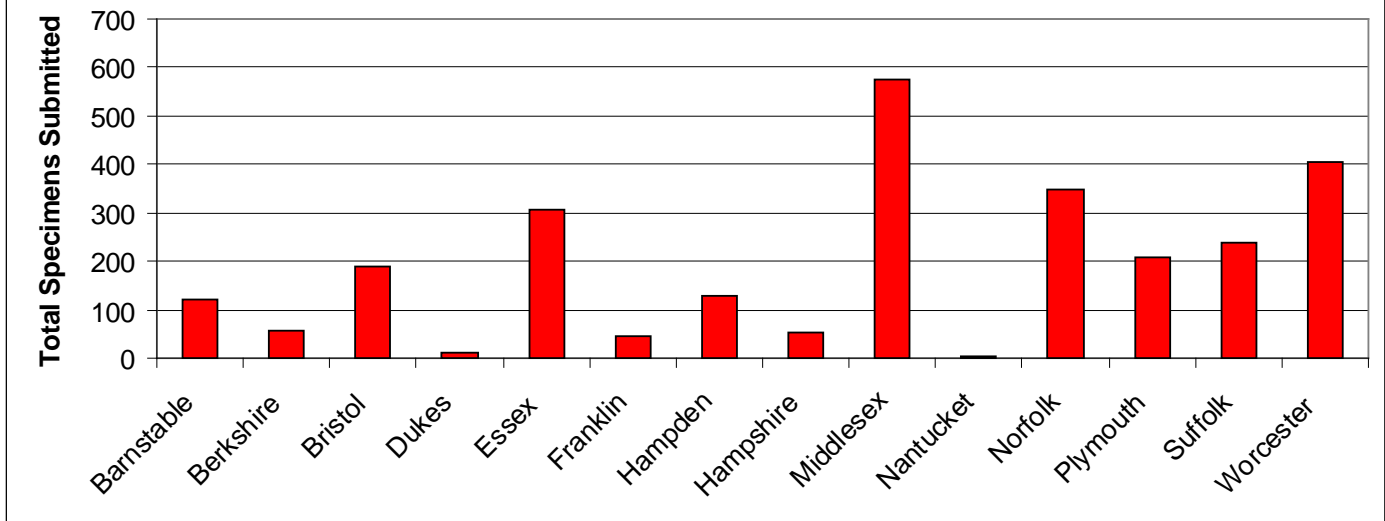
Submissions and Positive Results by County

In 2013, all counties in Massachusetts submitted at least one animal for rabies testing, and all counties, except Nantucket and Dukes, had at least one animal that tested positive (see **Table 4** below). Middlesex, Worcester, and Norfolk counties submitted the highest number of animals (n = 575, n = 403, n = 350, respectively). Worcester County had the highest number of animals that tested positive (n = 26) and Franklin County had the highest proportion of submitted animals that tested positive (13.3%).

Table 4. Rabies Testing Data by County- Number of Animals Positive for Rabies/Number of Animals Submitted (%)*					
County	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Cumulative
Barnstable	1/16 (6%)	0/32 (--)	0/56 (--)	0/18 (--)	1/122 (1%)
Berkshire	0/12 (--)	0/11 (--)	1/21 (5%)	3/13 (23%)	4/57 (7%)
Bristol	0/21 (--)	3/45 (7%)	3/98 (3%)	0/25 (--)	6/189 (3%)
Dukes	0/0 (--)	0/4 (--)	0/7 (--)	0/1 (--)	0/12 (--)
Essex	3/50 (6%)	3/71 (4%)	5/131 (4%)	2/45 (4%)	13/306 (4%)
Franklin	1/10 (10%)	1/12 (8%)	1/14 (7%)	3/9 (33%)	6/45 (13%)
Hampden	1/29 (3%)	1/24 (4%)	2/52 (4%)	1/23 (4%)	5/128 (4%)
Hampshire	1/8 (13%)	0/9 (--)	0/26 (--)	0/10 (--)	1/53 (2%)
Middlesex	5/74 (7%)	3/140 (2%)	10/278 (4%)	2/83 (2%)	20/575 (3%)
Nantucket	0/0 (--)	0/1 (--)	0/1 (--)	0/0 (--)	0/2 (--)
Norfolk	0/47 (--)	3/78 (4%)	5/164 (3%)	2/61 (3%)	10/350 (3%)
Plymouth	1/30 (3%)	1/47 (4%)	2/98 (2%)	0/33 (--)	4/208 (2%)
Suffolk	0/48 (--)	0/48 (--)	1/104 (1%)	0/39 (--)	1/239 (1%)
Worcester	6/61 (9%)	7/107 (7%)	6/182 (3%)	7/53 (13%)	26/403 (6%)

* Calculated to nearest percent

Figure 4: The Number of Animals Submitted for Rabies Testing by County, 2013



Mapping

MDPH maps rabies-positive terrestrial animals on an annual basis (see **Figure 5**).

Figure 5.

Terrestrial Animals Positive for Rabies By Receipt Year

